



BRIEFING: FEBRUARY 2013 BOARD MEETING AGENDA ITEM #5

TO: California High-Speed Rail Board of Directors

FROM: Jon Tapping, Risk Manager

DATE: February 14, 2013

RE: System Safety Report Informational Item

Summary

The California High-Speed Rail Authority (Authority) is responsible for designing, constructing, implementing, and operating a safe and secure high-speed train system. System safety considers all of the critical elements of a complex system, examining the interfaces and effects that each element has upon each other and on the system as a whole. Safety-critical elements of The California High-Speed Train System (System) include rolling stock; infrastructure such as the overhead contact system, stations, viaducts, tunnels, trenches track and trainway; operating procedures and employees; and the interfaces with the surrounding communities including public safety and emergency response plans and procedures. All of these elements must be considered individually and in totality so that the resulting level of safety is acceptable to the Authority.

Background

The Federal Railroad Administration (FRA) requires that the Authority certify the safety of the System prior to the start of revenue operation. The *Rail Safety Improvement Act of 2008* identified risk-based system safety programs as the basis for ensuring safety for passenger railroads in the United States. To achieve FRA approval to commence operation the Authority must:

- Establish a Safety and Security Policy Statement that defines the level of safety to be achieved in the System, establishes processes and assigns responsibilities for achieving safety
- Manage safety hazards and apply a proven, documented safety certification program
- Develop a fire and life-safety program that considers the safety of passengers, employees, emergency responders, and the public at large
- Establish standards for safety during the construction phase

All of these elements together form the safety case that will assure the Authority, the FRA, and the public that the System is safe for revenue operation.

Issue

The Program Management Team, in support of the Authority, has developed safety programs during the preliminary engineering phase of the Project that work toward achieving the system safety goals. Activities to date include:

- The establishment of a **Safety and Security Policy Statement** (Technical Memorandum 500.01 - attached). This document, authorized by CEO Jeff Morales, clearly articulates the policy of the Authority: to design, construct, implement, and operate a safe and secure high-speed train system. The Policy Statement applies to all employees, contractors, and subcontractors who work on the development and operation of the System.
- The establishment of a **Hazard Management Program**. Hazard management consists of a four-step process:
 1. Hazard identification, which includes activities such as brainstorming workshops, review of commonly-known hazards and regulatory requirements, use of historic data, and input from the experience of the technical experts for the various safety-critical elements. These activities all inform the development of a Certifiable Elements and Hazards Log which is used to identify and track the hazards and mitigations that could affect the safe operation of the System. The Log is initiated during the conceptual design phase of the project and is carried through the complete project life cycle.
 2. Hazard analysis, which examines the severity and probability of the identified hazards in order to establish a hazard risk assessment. Hazard analysis occurs on both a program-wide level and a site-specific level, and can be quantitative or qualitative depending on the nature of the analysis and the availability of data.
 3. Development of measures of mitigation which reduce the hazard risk until the residual risk is acceptable to the Authority.
 4. The Authority accepts the residual risk, understanding that further application of mitigations may not achieve further reductions in hazard risk.

A key component of the hazard management program is the use of an established, consistent safety certification program. The System will be safety certified using the European standard called verification and validation, whereby all hazard mitigations of the system are verified for their application at each phase of the project life cycle and validated for their applicability and implementation. Designers, builders, and implementers all certify that their individual contributions follow the requirements of the system safety program. Clear, consistent documentation of the safety certification activities will be made at each project phase and carried through the entire project life cycle. The end result will be a certified safety case that assures the Authority, FRA, and the public that the System is safe for operation.

- The establishment of a **Fire and Life-Safety Program**. Initial outreach to the Office of the State Fire Marshal (OSFM) began in late 2011, and working sessions began in 2012 to develop program-wide design criteria for fire and life-safety, addressing the safety of passengers and emergency responders with respect to fire, smoke, evacuation, and emergency response. OSFM is the authority having jurisdiction for fire and life-safety for

the System and is working with the Authority to develop design criteria that can be applied consistently across the entire System.

Initial outreach meetings have also occurred with emergency response agencies in the Central Valley. A program of regular Fire & Life-Safety and Security Committee meetings has been established in the Fresno/Madera region that allows for formal interaction between the Authority and the local emergency responders.

- The inclusion of requirements for a **Construction Safety Program** in the Request for Proposals for CP01. The Authority is ultimately responsible for the safety of persons who come in contact with construction activities on or related to Authority property and has established strict requirements for the Design/Build Contractors to follow. These requirements include establishing a site-specific health and safety program that is in compliance with all applicable Cal/OSHA regulations and guidance, a job-site hazard management program that addresses the safety of employees and the public, safety certification in conformance with the Authority's Safety Certification Program, and the responsibility to see that all of these activities are effectively carried out within the scope of their work.

Staff Recommendation

For information only - no recommendation.

Attachments

- Technical Memorandum 500.01 *Safety and Security Policy Statement*